You are provided with two plane mirrors, an optical pin, a sheet of plane drawing paper, mirror holder or office pins, a protractor, a ruler and a drawing table. Proceed as follows:

(a) Draw two lines at right angles.

(b) Place the two plane mirrors along the top two lines using the mirror holders or office pins as shown in Figure 2.

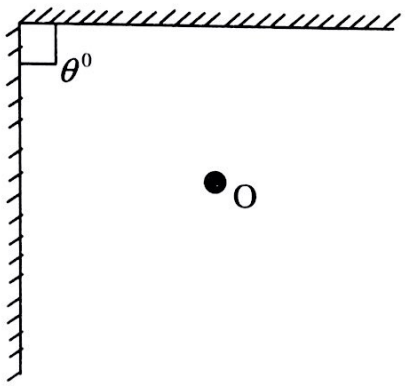

Figure 2

(c) Put an optical pin at O when $\theta = 90^o$. Look onto one of the mirrors and count the number of images, n, you see.

(d) Repeat the procedures in 2 (c) for $\theta = 72^o$, $\theta = 60^o$, $\theta = 45^o$ and $\theta = 30^o$.

(e) Tabulate your results for the values of θ, n and $\frac{360^0}{\theta}$.

(f) Plot a graph of number of images, n, against $\frac{360^0}{\theta}$.

(g) From the graph:

(i) Determine the slope.

(ii) Find the number of images when $\frac{360^0}{\theta} = 9$.

(iii) Find the value of the y-intercept.

(iv) Derive the equation relating the number of images and $\frac{360^0}{\theta}$.

(h) From your experiment:

(i) What happens to the number of images as the value angle θ is reduced.

(ii) What happens to the number of images when $\theta = 0^o$?

(i) State a possible source of error and how you can minimize it.

(j) What is the aim of this experiment?